

[0017] The proportioning of egg white to grain varies with the particular chosen grain and other ingredients such as cheese that are used in the formulation of a snack. Cheese, starch, sugar, and edible gums are often included in the grain recipes and help diminish the quantity of egg white used. In all cases, egg white is a necessary but only minor portion (less than 5% by weight) of the grain snack recipe which is easily established by simple trial and error tests.

BRIEF DESCRIPTION OF THE DRAWING

[0018] For further clarification of the invention, the following description will refer to the appended drawing which is a schematic flowsheet of the novel process.

DESCRIPTION OF PREFERRED EMBODIMENTS

[0019] The pressure-formation of snacks by extrusion is illustrated by flowsheet 10 depicting hopper 11 in which a grain snack recipe containing egg white is supplied. The grain recipe flows from hopper 11 into screw feeder 12 of extruder 13 which forces the grain recipe through several side-by-side extrusion ports 14. The several extruded ribbons of grain recipe fall on conveyor belt 15. Rotary cutter 16 positioned over belt 15 serves to cut the extruded ribbons into segments of desired length.

[0020] The segments then pass from conveyor 15 over chute plate 17 to conveyor 18. The belt of conveyor 15 is preferably smooth and imperforate to provide a firm surface against which each radial blade of rotary cutter 16 can press to sever the ribbons of extruded grain into snack-size segments. By contrast, the belt of conveyor 18 is reticular or net-like, formed of metal, usually stainless steel.

[0021] A pair of superheated steam chests 19 are positioned on opposite sides of the top run of conveyor belt 18. Each chest 19 has multiple jets 20 aimed at belt 18. Chests 19 are preferably opposite one another so that their jets 20 simultaneously blast the tops and bottoms of the snack segments with superheated steam to effect setting of egg white as skin and binder of the grain snacks.

[0022] As the snack segments leave the zone of superheated steam chests 19, they are cooled, usually by blowing cool air (not shown) against them. The cooled segments are then frozen by any known method such as spraying with liquid carbon dioxide or nitrogen.

[0023] The alternate method of press-forming snacks by molding pursuant to this invention is illustrated by a simple modification of the flowsheet. In lieu of extruder 13 with extrusion ports 14, screw feeder 12 forces the pasty grain recipe into a patty-forming machine, such as that of the Orlowski et al patent which has several mold cavities. The patty-shaped snacks thus formed drop on conveyor 15 (rotary cutter is eliminated) and are transferred via chute plate 17 to reticular conveyor 18 for treatment with superheated steam from jets 20.

[0024] The frozen grain snacks are packaged for distribution to all sorts of food outlets including restaurants and supermarkets. When they are to be served, the frozen snacks are heated in a conventional or microwave oven, or by immersion in hot liquid such as oil or syrup. A few examples of grain snacks produced pursuant to this invention will

illustrate the wide variety attainable, such as grits snacks for breakfast, sweet oatmeal snacks for children, and macaroni snacks served with cocktails.

EXAMPLE 1

Cooked Grits are Mixed with Egg White and Other Ingredients in Weight Proportions as Tabulated:

[0025]

cooked grits	600
egg white	50
starch	30
corn flour	100
water	30
butter	15
flavor	0.7

[0026] The well mixed recipe is extruded as cylindrical ropes (0.6 inch diameter) which are cut into three-inch segments that are blasted with superheated steam at a temperature of 320° C. for a minute. The resulting product is frozen as previously discussed. When this frozen grits snack is to be served, it is heated and butter or maple syrup is added.

EXAMPLE 2

A Children's Oatmeal Snack has the Following Formulation in Weight Parts:

[0027]

cooked oatmeal admixed with a minor portion of grits	950
brown sugar	150
corn flour	100
margarine	50
egg white	40
maple syrup	75
water	50

[0028] This well mixed recipe is extruded as ribbons (1 inch wide, 0.25 thick) which are cut diagonally (30 degrees). After treatment with superheated steam at 340° C. the sweet snack is frozen for distribution, especially to fast food restaurants where the thawed snack can be eaten without any addition or further treatment.

EXAMPLE 3

A Cocktail Type of Snack Based on Cooked Macaroni has the Following Recipe in Weight Parts:

[0029]

cooked macaroni (tiny bowties)	500
cheese sauce including minor portions of whey, starch and water	250